Extended range of bobucks *Trichosurus cunninghami* in south-west Gippsland, Victoria

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Abstract
Automatic camera-traps were used to investigate the distribution of Mountain Brushtail Possum or Bobuck *Trichosurus cunninghami* in diverse habitats in south-west Gippsland, Victoria. Bobucks occur widely in lowland south-west Gippsland, with an apparent tendency to aggregate near the coast. There appeared to be no association between bobucks and the presence or absence of *Acacia* spp. or with old-growth *Eucalyptus* spp. A new designation of the common names for the short-eared possum, *Trichosurus caninus*, and the mountain brushtail possum, *Trichosurus cunninghami*, to northern bobuck and southern bobuck, respectively, is proposed. (*The Victorian Naturalist* **127** (1) 2010, 15-19)

Keywords: *Trichosurus caninus*; *Trichosurus cunninghami*; mountain brushtail possum; short-eared possum; bobuck; camera trap

Introduction

The Bobuck *Trichosurus cunninghami* and the Short-eared Possum *Trichosurus caninus* are reported to inhabit forested country along and to the south and east of the Great Dividing Range of eastern Australia, from southern Victoria to south-eastern Queensland (Lindenmayer *et al.* 2002; Menkhorst and Knight 2001). They dwell typically at altitudes greater than 300 m (Martin 2005). Bobucks are medium-sized (2.5 – 4.5 kg), semi-arboreal, nocturnal marsupials (Menkhorst and Knight 2001).

In 2002, based upon morphometric differences, it was proposed that the Mountain Brushtail Possum *T. caninus* be reclassified into two distinct species (Lindenmayer *et al.* 2002). The northern form was to retain the binomial name *T. caninus* but was henceforth to be known as the 'short-eared possum'. The southern population, prevalent in the Victorian Alps and elsewhere in Victoria, such as at Wilsons Promontory National Park, was to retain its already designated common name 'mountain brushtail possum' but was given a new binomial, *T. cunninghami*. However, genetic divergence between *T. caninus* and the putative *T. cunninghami* may not support a case for the establishment of a new species. Collins (2003) noted that the degree of intra-specific variation within the common brushtail possum, *T. vulpecula*, would if interpreted similarly, justify the replacement of that one taxon by ten. It seems unlikely that ten new species of common brushtail possum would represent a practical improvement in that animal's designation.

The authors previously reported the presence of Bobucks *T. caninus* living in atypical coastal habitat in south-west Gippsland, namely at The Gurdies Reserve (Hynes and Cleeland 2005), north of Grantville on Western Port, Victoria, and in a creek adjoining the Bass River south of Grantville (Hynes 2006). In view of the lack of consensus surrounding the proper classification of the northern and southern populations of short-eared or mountain brushtail possums, the authors now provisionally revert to the usage of *T. cunninghami* to refer to the population found in The Gurdies Reserve and in broader Gippsland and will speak of these animals simply as 'bobucks'.

As a result of the 2005-2006 discovery in The Gurdies Reserve, the question arose as to how widespread bobucks of the Western Port shore really were. Did they exist as isolated population 'islands' only near The Gurdies Reserve itself or were they perhaps to be found far and wide in lowland Gippsland?

In order to discover more about these animals' distribution, automatic camera-traps were placed at a range of locations over a 12 month period beginning early 2006 and continuing to the present. We discovered that bobucks are widely distributed and apparently numerous in south-west Gippsland. This discovery was surprising in view of the previous absence of reports of them in the literature and the paucity of anecdotal reports about them.

Methods

Between early 2006 and April 2007 automatic camera traps were deployed at 11 sites in south-west Gippsland. Specific locations are presented in Fig. 1. Sites were selected in state parks and on public land where native vegetation was present. Five cameras were purpose built for this survey. After initial deployment at each site, cameras were usually retrieved after one to two weeks. If a site was fruitful (Gurdies) or, alternatively, if a site appeared barren of bobucks (Outtrim) after one or two visits, the cameras might be changed over several times in order to ascertain with reasonable surety whether bobucks were present or not. A failure to detect might be because bobucks were absent from the general area, or an apparent absence could be due to their failure to appear before the instruments. The interval between camera retrievals or change-overs depended upon opportunities to travel to Gippsland for the purpose.

The instruments detect animals by means of the heat radiation their bodies emit (Hynes and Cleeland 2005). A passing animal is detected by means of an infrared sensor, an algorithm programmed into an embedded microcontroller then assesses the validity of the contact, taking into account factors such as ambient light conditions, the target's rate of movement and duration of the contact. If the algorithm decides that a valid target has been acquired, the controller activates a digital camera and a useful image is captured. When the target moves away, the instrument reverts to a 'sleep mode' in which very little electric current is drawn from the system's battery. By so conserving the battery's charge, the instrument is able to remain active in the field for long periods. Because the instruments attempt a 'shot' only when the chances of a useful picture are good, the proportion of photos with an actual animal in the frame instead of empty space are higher than with systems that fire on first contact (Hynes 2007).

The camera used was a Kodak DC50, one of the earliest commercially available digital cameras. A severe limitation of these cameras is the fact that they do not have a date-time recorder as part of their instruction set. Another limitation of the DC50 is that it lacks any practical means of remote operation. A particular advantage of the DC50 is its short focal length: it can focus on objects as close as 12 cm out to infinity. This means that small animals stay in focus at close range which helps with their identification.

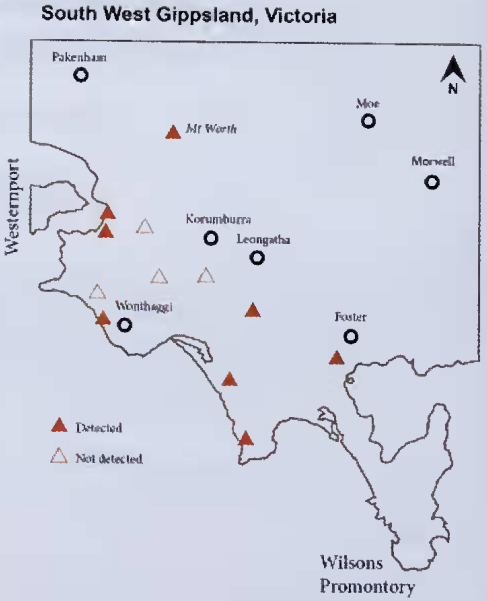

Fig. 1. Camera-trap sites in south-west Gippsland. Solid red triangles = Bobucks detected; empty red triangles = Bobucks not detected.

The designer's dilemma in this type of photography is to find a camera that is both cheap and technically suitable, as the outdoors environment is unforgiving to electronic instrumentation. A major design criterion for this project was to develop a photographic system that was both robust and inexpensive.

In addition to camera placements at suitable locations, local information about Bobucks in Gippsland was sought by means of print media coverage of the survey, direct personal communication and by means of the Survey's website (http://www.thylacoleo.com/bobuck_underground/).

Results

Bobucks occur widely throughout lowland south-west Gippsland. Locations of camera-trap sites and the results obtained along with brief notes about the soils and vegetation at each site are presented in Table 1.

Previous sightings

Surprisingly little local knowledge of bobucks was revealed after efforts were made to deter-

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Table 1. Locations of camera-trap sites. Latitude and longitude were estimated in Google Earth. Multiple deployments within a few metres of one another are designated at ♯ = A, * = B, ⁺ = C. Note: Bobucks detected post-survey at Candowie Reservoir North Arm on 18/02/2008.

	Latitude	Longitude	Altitude (m)	Date Retrieved	Soils	Vegetation	Bobucks Detected?
Gurdies	38° 22' 51.89"S	145° 33' 24.41"E	<7	4/9/2004 21/8/2004 25/1/2008 18/2/2008 7/2/2008	Humus rich sand overlying gravel substrate	Messmate *Eucalyptus obliqua*, Bracken *Pteridium esculentum*, Common reed *Phragmites australis*	Yes
Bass River	38° 26'32.11"S	145° 32' 56.23"E	~50	24/11/2005	Humus rich sand overlying gravel substrate	Messmate *E. obliqua*, Bracken *Pteridium esculentum*, some Prickly Tea Tree *Leptospermum continentale*	Yes
St Heliers	38° 23'46.93"S	145° 34' 8.36"E	~90	28/7/2006	Humus-rich duplex	Messmate *E. obliqua* verging onto paddocks, with pasture grass	No
Koonwarra	38° 33'40.46"S	145° 55' 16.77"E	~60	24/3/2007 27/4/2007 13/4/2007 1/4/2006	Sandy, disturbed after quarrying	Prickly Tea Tree *L. continentale* scrub, sparse ground cover, grasses. Silver Wattle *Acacia dealbata* virtually absent: only two Silver Wattles were noted within 200 m of the camera site	Yes
St Alveys	38° 31' 35.54"S	145° 41' 59.76"E	~80	6/10/2006	Duplex clay	Messmate *E. obliqua*, Blue gum *E. globulus*, Silver Wattle *A. dealbata*	No
Outtrim	38° 30' 47.49"S	145° 46' 39.37"E	~60	3/3/2007 ♯8/4/2007 *8/4/2007 *3/7/2007 10/3/2007 18/3/2007	Shallow duplex clay	Swamp Gum *E. ovata*, Peppermint *E. radiata*, Prickly Tea Tree *L. continentale*	Yes
Foster	38° 44' 14.68"S	146° 9' 48.00"E	~20	16/6/2006	Duplex clay	Messmate *E. obliqua*, Bracken *P. esculentum*, grassed areas	Yes
Bald Hills	38° 44' 0.76"S	145° 56' 27.68"E	~20	14/9/2006		Tea Tree *Melaleuca ericifolia*, no ground cover	Yes
Ten Mile Scrub	38° 48'16.62"S	145° 56' 27.54"E	~50	14/9/2006	Sandy clay duplex	Messmate *E. obliqua*, Bracken *P. esculentum*	Yes
Powlett River No. 1	38° 35' 1.24"S	145° 31' 12.05"E	<7	18/9/2007	Coastal sand	Coastal Tea Tree *L. laevigatum*	Yes
Powlett River No. 2	38° 34' 3.56"S	145° 30' 19.08"E	<7	25/1/2008 ♯18/9/2007 *18/9/2007	Coastal sand	Coastal Manna Gum *E. pryoriana*, Coastal Tea Tree *L. laevigatum*	No
Mount Worth	38° 18' 0.34"S	145° 58' 42.53"E	~400	⁺11/2/2007 *11/2/2007 ♯11/2/2007 23/2/2007	Duplex clay	Mountain Ash *E. regnans*, Black wood *A. melanoxylon*, Silver Wattle *A. dealbata*, Soft Tree Fern *Dicksonia antarctica*	Yes